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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/607,631	06/27/2003	F. Chris Minion	08411-035001	5135

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FISH & RICHARDSON P.C.
PO BOX 1022
MINNEAPOLIS, MN 55440-1022

EXAMINER	
BASKAR, PADMAVATHI	
ART UNIT	**PAPER NUMBER**
1645	

DATE MAILED: 01/05/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/607,631	MINION ET AL.	
	Examiner	Art Unit	
	Padmavathi v. Baskar	1645	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-27* is/are pending in the application.

4a) Of the above claim(s) *6-26* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5 and 27* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *7/26/05; 3/14/05*, 12/29/03
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election

1. Applicant's election of Group I, claims 1-5 and 27, SEQ.ID.NO: 8 without traverse in the reply filed on 10/3/05 is acknowledged.

Status of Claims

2. Claims 1-27 are pending in the application.

Claims 1-5 and 27 with respect to SEQ.ID.NO: 8 are under examination.

Claims 6-26 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim.

Applicant timely traversed the restriction (election) requirement in the reply filed on 10/4/05.

Applicant is advised to amend the claims 1-5 and 27 to restrict to SEQ.ID.NO: 8 as it is an elected invention.

Information Disclosure Statement

3. Information Disclosure Statements filed on 7/26/05, 3/14/05 and 12/29/03 are acknowledged. The IDS filed on 7/26/05 is a duplicate copy of IDS sent on 3/14/05. Therefore, IDS filed on 7/26/05 has been marked as duplicate copy and is not considered. However, IDS filed on 3/14/05 and IDS filed on12/29/03 have been reviewed and a signed copy of each is attached to this Office action.

Priority

4. This application 10/607,631claims priority to Provisional Application 60/392632 filed on 06/28/2002 is acknowledged.

Claim Rejections - 35 USC 112

5. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying

6. Claims 1-5 and 27 are rejected under 35 U.5.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. This is a written description rejection.

The Claims are drawn to a purified immunogenic polypeptide or mutant, the amino acid sequence of which comprises at least eight consecutive residues or at least 12 consecutive residues of a sequence SEQ ID NO: 8, Claims are also drawn to a composition and a kit comprising said polypeptide SEQ ID NO: 8

The specification describes Enzootic pneumonia in swine, also called Mycoplasma pneumonia, and is caused by *Mycoplasma hyopneumoniae.* The disease is chronic and non-fatal, affecting pigs of all ages. The specification discloses as part of the invention, an isolated recombinant polypeptide comprising the amino acid sequence SEQ ID NO: 8. The specification teaches that this polypeptide contains 1879 amino acids. The specification asserts protein could be useful in diagnosis, prevention and treatment of Mycoplasma pneumonia. However, the specification fails to disclose a purified immunogenic polypeptide or mutant comprising at least eight consecutive residues or at least 12 consecutive residues of a sequence SEQ ID NO: 8. Applicants broadly describe the invention as embracing any deletion by use of language in which a specified percent of amino acids can be changed in the protein. SEQ ID NO: 8. USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the 'written description' inquiry, whatever is now claimed." (See

page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that (he or she] invented what is claimed." (See Vas-Cath at page 1116). Therefore, an isolated and purified polypeptide comprising the amino acid sequence SEQ.ID.NO: 1 and an isolated and purified polypeptide consisting of 8 consecutive residues or 12 consecutive residues of the amino acid sequence SEQ ID NO: 8 meets the written description provision of 35 U.S.C. 112, first paragraph for the reasons set forth below:

The specification fails to teach an isolated polypeptide comprising at least 8 consecutive or at least 12 consecutive amino acid sequence, SEQ.ID.NO: 8 and is noted that the claimed polypeptide do not exist as an invention independent of their function.

The actual relevant identifying characteristics of each claimed polypeptide can only be determined empirically by actually making every nucleic acid that encodes the recited variants and testing each to determine whether such a variant having the particularly disclosed properties of the full length polypeptide. For example, if there is a well-established correlation between structure and function in the art, one skilled in the art will be able to reasonable predict the complete structure of the claimed invention from its function. This specification does not teach such, and the art is devoid of this correlation of an isolated polypeptide comprising at least 8 consecutive or at least 12 consecutive amino acid sequence, SEQ.ID.NO: 8 with undetermined function. In addition, an isolated and purified polypeptide comprising (open language) a 8 or 12 consecutive amino acid sequence SEQ.ID.NO: 8 plus unlimited and unknown amino acids would result in an unknown polypeptide without sufficient structure and completely lacking identifying characteristics. The specification fails to disclose any deletion or change in nucleic acid encoding an amino acid sequence, SEQ.ID.NO: 8 to obtain said polypeptide. The specification does not describe any use of said variant as claimed (comprising, open language) in identifying *Mycoplasma hyopneumoniae* and do not meet the

written description provision of 35 U.S.C. 112, first paragraph. Vas-Cath Inc. v. Mahurkar, 19 USPQ2d 1111, makes clear that "applicant must convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention. The invention is, for purposes of the 'written description' inquiry, whatever is now claimed." (See page 1117.) The specification does not "clearly allow persons of ordinary skill in the art to recognize that (he or she] invented what is claimed." (See Vas-Cath at page 1116).

Thus, the specification fails to teach an isolated polypeptide comprising 8 or 12 consecutive amino acid sequence and does not satisfy the written description guidelines because the claimed polypeptide variant has not been disclosed in this application. Adequate written description requires more than a mere statement that it is part of the invention and reference to a potential method for making it. See Fiers v. Revel, 25 U5PQ2d 1601, 1606 (CAFC 1993) and Amgen Inc V Chugai Pharmaceutical Co Ltd., 18 U5PQ2d 1016. One cannot describe what one has not conceived. See Fiddes v. Baird, 30 U5PQ2d 1481, 1483. In Fiddes v. Baird, claims directed to mammalian FGF's were found unpatentable due to lack of written description for the broad class.

7. Claims 1-5 and 27 are rejected under 35 U.5.C. 112, first paragraph because the specification, while being enabling for an isolated and purified polypeptide comprising the amino acid sequence SEQ.ID.NO: 1 and an isolated and purified polypeptide consisting of 8 consecutive residues or 12 consecutive residues of the amino acid sequence SEQ ID NO: 8, the composition and kit comprising said polypeptide, the specification does not reasonably provide enablement for an isolated polypeptide, a composition, and a kit comprising a purified polypeptide comprising 8 or 12 consecutive amino acid sequence of SEQ.ID.NO: 8 (The examiner is considering all these as variants). The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use

the invention commensurate in scope with the claims is maintained as set forth in the previous office action.

The instant claims are evaluated for enablement based on the Wands analysis. Many of the factors regarding undue experimentation have been summarized in *In re Wands*, 858 F.2d 731,8 USPQ2d 1400 (Fed.Circ.1988) as follows:

(1) the nature of the invention, (2) the state of the prior art, (3) the predictability or lack thereof in the art, (4) the amount of direction or guidance present, (5) the presence or absence of working examples, (6) the quantity of experimentation necessary, (7) the relative skill of those in the art, and (8) the breadth of the claims.

The nature of the disclosed invention is preparing a recombinant polypeptide SEQ.ID.NO: 8 from *Mycoplasma hyopneumoniae* strain 232. The specification indicates that the claimed an isolated recombinant polypeptide comprising the amino acid sequence SEQ ID NO: 8 that contains 1879 amino acids. However, the specification does not disclose variants of SEQ.ID.NO: 8. The specification fails to provide an enabling disclosure other than an isolated recombinant polypeptide comprising the amino acid sequence SEQ ID NO: 8 or an isolated polypeptide consisting of 8 consecutive residues or 12 consecutive residues of the amino acid sequence SEQ ID NO: 8, because it fails to provide any guidance regarding how to make and use an isolated polypeptide comprising (open language) 8 or 12 consecutive amino acid sequence SEQ.ID.NO: 8 (examiner is viewing them as variants and will be referred as variants).

The specification fails to provide guidance for an isolated polypeptide comprising, (open language) 8 consecutive residues or 12 consecutive residues of SEQ ID NO: 8 plus unlimited and unknown amino acids that would result in an unknown variants without any structure and other identifying characteristics such as function. Thus, variants as claimed are broader than

SEQ.ID.NO: 8 and the specification fail to provide sufficient guidance such that one of ordinary skill in the art can predict a priori what protein variants can be made. Further, to make proteins encoded by nucleic acid without structure and function are not routine in the art. Therefore, none of the criteria as suggested by the applicant are not satisfied.

The specification, however, provides no working examples demonstrating (i.e., guidance) enablement for any isolated polypeptide comprising (open language) 8 or 12 amino acids of SEQ.ID.NO: 8 plus unlimited and unknown amino acids.

The state of the art indicates that *Mycoplasma hyopneumoniae*, the etiological agent of enzootic pneumonia, significantly impacts swine production. During colonization, *M. hyopneumoniae* forms an intricate association with the ciliated epithelial lining of the porcine respiratory tract, leading to chronic respiratory disease. Colonization disrupts the normal function of the mucociliary escalator through ciliostasis, loss of cilia, epithelial cell death, and acute inflammation. This results in a purulent exudate (composed primarily of neutrophils and mononuclear cells) in the airways. Disease resolution occurs only after a prolonged period (if at all). *M. hyopneumoniae* colonization also predisposes the host to more-severe infections from secondary pathogens For example, it is now clear that colonization by *M. hyopneumoniae* leads to more-severe and longer-lasting disease with the porcine respiratory and reproductive syndrome virus. The art also teaches that the initial event in colonization by *M. hyopneumoniae* is binding to swine respiratory cilia. In the absence of binding activity, colonization does not occur. Identification of the molecules involved in cilium binding has been shown using adherence-blocking monoclonal antibodies (Zhang et al, Infect. Immun., Mar 1995, 1013-1019, Vol 63, No. 3) in a binding assay taught by Giron et al (Infect. Immun., Jan. 1996, p. 197–208 Vol. 64, No. 1.) However the art is devoid of variants as claimed can be used to identify M.

hyopneumoniae and the specification does not disclose the claimed variants can be used to identify M. *hyopneumoniae.*

As taught by the prior art (Burgess et al., The Journal of Cell Biology, 111:2129-2138, 1990). any substitution, insertion or deletion or change in a protein is highly complex and unpredictable and even a single amino acid change in a protein leads to unpredictable changes in the biological activity of the protein. For example, replacement of a single lysine residue at position 118 of the acidic fibroblast growth factor by glutamic acid led to a substantial loss of heparin binding, receptor binding, and biological-activity of the protein (Burgess et al., The Journal of Cell Biology, 111:2129-2138, 1990). Thus, it is apparent that change in a peptide leads to loss of binding property of that peptide. Therefore, it is unclear whether isolated polypeptide comprising, (open language) 8 consecutive residues or 12 consecutive residues of SEQ ID NO: 8 can be used to screen for identifying other strains or even as diagnostic tool for identifying *Mycoplasma hyopneumoniae* strain 232. Thus, variants of said polypeptide must be considered highly unpredictable, requiring a specific demonstration of efficacy on a case-by-case basis. Absent such demonstration, the invention would require undue experimentation to practice as claimed.

Claim Rejections - 35 USC 102

8. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

9. Claims 1-5 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by database Uniprot_03, Accession number Q9KGX7 or. Q9KGX9

The Claims are drawn to a purified immunogenic polypeptide or mutant, the amino acid sequence of which comprises at least eight consecutive residues or at least 12 consecutive residues of a sequence SEQ ID NO: 8, Claims are also drawn to a composition and a kit comprising said polypeptide SEQ ID NO: 8.

Accession number Q9KGX7 disclose polypeptide comprising 8 or 12 consecutive residues of SEQ.ID.NO: 8 (see the sequence alignment of Q9KGX7 with the claimed SEQ.ID.NO:8). The disclosed polypeptide comprises 560 amino acids that contains 8 or 12 consecutive residues of SEQ.ID.NO: 8 and is 100% identical with the claimed immunogenic polypeptide of claim 1, 2. The same polypeptide Q9KGX7reads on claim 4 mutant as the prior art polypeptide contains amino acid Aspartic acid "D" in place of Glutamic acid "E at position 544. The art teaches that an immunogenic polypeptide (i.e., antigen or epitope) is roughly 5 amino acids in size and can elicit an immune response and react with an antibody. Therefore, the disclosed polypeptide meets the limitation of claims 1-2 and 4. The same polypeptide Q9KGX7 read on the composition claims 3 and 5 (composition contains only immunogenic polypeptide) because the disclosed polypeptide to which an immune response has to be elicited is in general in hydrophilic phase, buffer or saline and is routinely used in the art. Similarly immunogenic polypeptide Q9KGX7 reads on the kit claim 27 because the claimed kit contains only polypeptide, which binds to an antibody. Thus the prior art anticipated the claimed invention.

10. Claims 1-5 and 27 are rejected under 35 U.S.C. 102(b) as being anticipated by Zhang et al Infect. Immun., Mar 1995, 1013-1019, Vol 63, No. 3.

The transitional phrase or term "comprises" similar to the phrases or terms, such as, "has", "includes," "contains," or "characterized by," represents open-ended claim language and therefore does not exclude additional, unrecited elements. See M.P.E.P 2111.03 [R-1]. See *Molecular Research Corp. v. CBS, Inc., 793 F2d 1261, 229 USPQ 805 (Fed. Cir. 1986); In re Baxter, 656 F.2d 679, 686, 210 USPQ 795, 803 (CCPA 1981); Ex parte Davis, 80 USPQ 448, 450 (Bd. App.1948)* ("comprising" leaves "the claim open. for the inclusion of unspecified ingredients even in major amounts". On the other hand, the limitation "consisting of represents closed claim language and excludes any element, step, or ingredient not specified in the claim. In *re Gray, 53 F. 2d 520, Il USPQ 255 (CCPA 1931); Ex parte Davis, 80 USPQ 448, 450 (Bd. App. 1948).*
Claims have been described supra.

Zhang et al 1995 disclose purified (Affinity chromatography) Mycoplasma proteins from pathogenic *M. hyopneumoniae* strains 232, 2A3 and 232 FA1 in PBS containing CHAPS (see page 1013, right column, first paragraph and 1014, left column, last paragraph). This composition contains purified immunogenic polypeptides SEQ.ID.NO: 8 and mutants of said polypeptide. The composition comprising purified polypeptides in PBS read on the claimed invention as it contains immunogenic polypeptides such as 97 kD that reacted predominantly with monoclonal antibody (see Fig. 1). The prior art composition read on the kit claim 27 because the claimed kit contains only polypeptide, which binds to monoclonal antibody and the disclosed polypeptide also binds to (MAb), F2G5. Thus the prior art anticipated the claimed invention.

Applicant's use of the open-ended term "comprising "in claims 1-5 and 27 fails to exclude unrecited steps or ingredients and leaves the claims open for inclusion of unspecified ingredients, even in major amounts. Therefore, the claims read on the disclosed composition comprising purified proteins such as 97 kD polypeptide. Thus the prior art anticipated the claimed invention. In the absence of evidence to the contrary the disclosed prior art proteins in

PBS is the same as claimed polypeptide and composition. Since the Office does not have the facilities for examining and comparing applicants' product polypeptide with the product of the prior art, the burden is on applicant to show a novel or unobvious difference between the claimed product and the product of the prior art. See In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and In re Fitzgerald et al., 205 USPQ 594.

Remarks

11. No claims are allowed.

Conclusions

12. Papers related to this application may be submitted to Group 1600, AU 1645 by facsimile transmission. Papers should be transmitted via the PTO Fax Center, which receives transmissions 24 hours a day and 7 days a week. The transmission of such papers by facsimile must conform to the notice published in the Official Gazette, 1096 OG 30, November 15, 1989. The Right Fax number is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PMR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PMR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PMR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Any inquiry concerning this communication or earlier communications from the Examiner should be directed to Padma Baskar Ph.D., whose telephone number is ((571) 272-0853. A message may be left on the Examiner's voice mail system. The Examiner can normally be reached on Monday to Friday from 6.30 a.m. to 4.00 p.m. except First Friday of each bi-week.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynette Smith can be reached on (571) 272-0864. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (571) 272-1600.

Padma Baskar Ph.D.

MARK NAVARRO
PRIMARY EXAMINER